

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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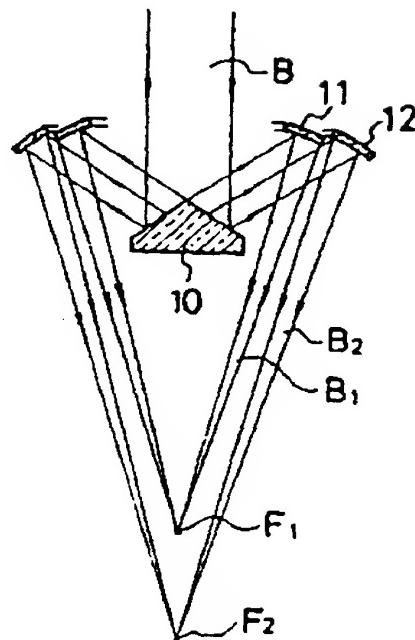
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APPLICANT : MITSUBISHI HEAVY IND LTD;

INVENTOR : HAMANAKA SUKEAKI;

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TITLE : MULTIFOCUSING LASER BEAM  
CONDENSING DEVICE



ABSTRACT : PURPOSE: To achieve a coaxial multifocus and heteroaxial multifocus and to achieve good welding, cutting and surface treatment by condensing a laser beam by plural mirror systems connecting mutually different focus.

CONSTITUTION: The laser beam B emitted from a laser oscillator is incident on a conical mirror 10 by conforming to the optical axis of annular concave mirrors 11, 12. The reflection beam from the conical mirror 10 is incident on the annular concave mirror 11 at its one part B<sub>1</sub>, other residual parts B<sub>2</sub> are incident on the annular concave mirror 12 and the reflection beams B<sub>1</sub>, B<sub>2</sub> from each concave mirror 11, 12 focus mutually different focal points F<sub>1</sub>, F<sub>2</sub>. Due to the annular concave mirrors 11, 12 having different focal distance each other being arranged coaxially the focal points F<sub>1</sub>, F<sub>2</sub> by 1st mirror system and a 2nd mirror system become of mutually different position on the co-axis. A deep penetration can thus be achieved even in case of welding and cutting a thick plate.

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